MARINE REVIEW.

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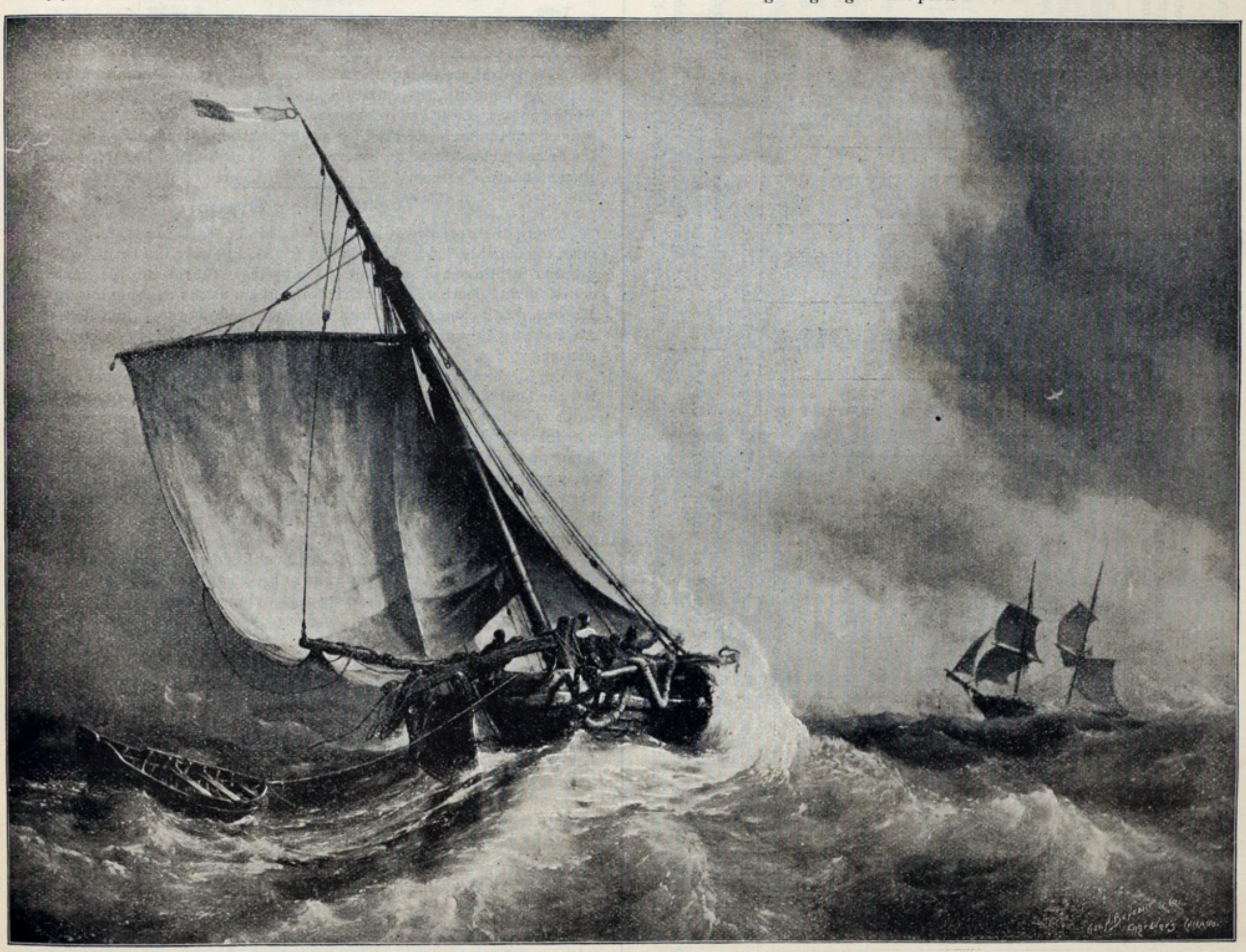
Phenominal Growth in Coal and Ore Production.

The growth of the mineral industry of the United States has been so rapid as to be wholly beyond comparison with any other nation. Fifty years ago this country began to take rank as one of the important producers. In twenty years it had won a position among the leading nations, and now it not only excels all others, but the value of its products is almost as great as the value of the combined output of Great Britain, France and Germany. In 1864 the United States with an output of 22,860,000 metric tons stood third among coal producing nations, Great Britain leading with over 90,000,000 tons, Germany 26,000,000. In the thirty years since that time, Great Britain has a little more than doubled its output. Germany has trebled, but the United States has increased eight times and produces now almost as much as Germany and all the rest of the world taken together, excepting only Great Britain. In the production of pig iron our growth has been even more remarkable. In 1865 the pig producing countries ranked with Great Britain first, then France, Germany and the United States, Great Britain alone producing almost six times as much as the United States. But in 1892 the output of the United States was more than 11 times as much as thirty years before, and almost half again as much as Great Britain; as much as Germany, France, Belgium and Austria-Hungary all together; or as Great Britain, France and Austria-Hungary together. These two staples, iron and coal, serve to show the quick rise to supremacy as a producing country.—"The Mineral Industry, 1893."

Lake Freight Matters.

As the mines producing Bessemer ore—barring the Missabes—have made sales about equal to a full output under active mining, the movement of this ore is sufficient to keep freights up to the figures at which the season opened—80 cents from Two Harbors, Duluth and Ashland, 65 cents from Marquette and 50 cents from Escanaba. The grain movement has not been sufficient to be of any help in the general freight situation. Buffalo shippers of hard coal paid an advance of 5 cents in Lake Michigan rates Tuesday, probably with a view to attracting tonnage to Buffalo while there is a certainty of moving coal cheaply, but the high price charged for fuel is a disadvantage in going to that port.



WEATHER—SOME OF THE KIND EXPERIENCED ON THE LAKES LAST WEEK.

Burning Hard Coal in the Brown.

On her last two trips from Ashland to Erie the new steel steamer Harvey H. Brown, built by the Detroit Dry Dock Company, has carried 3,006 and 3,009 gross tons, her draft under both cargoes being about 14 feet 6 inches. Capt. E. M. Peck and Mr. Harvey H. Brown are greatly pleased with the boat, particularly on account of fuel economy. On the last two trips she has taken hard coal at Erie for fuel and seems to steam even more efficiently than with soft coal. This is, of course, due largely to the use of the Howden hot draft system with which she is fitted. At prices now charged for fuel, the hard coal is found to be cheaper than the ordinary steam coal, and the owners of the Brown are congratulating themselves that they are able to take advantage of the situation.

Canals Connecting with the Great Lakes.

The following table, showing length, number and dimensions of locks, etc., of canals connecting with the great lakes, has been received from the hydrographic office, Washington, and is a sample of the kind of information which it is proposed to publish in connection with the pilot chart of the lakes:

TABLE SHOWING LENGTH, NUMBER AND DIMENSIONS OF LOCKS, ETC., OF CANALS CONNECTING WITH THE GREAT LAKES.

No	NAME OF CANAL.	TERMINAL POINTS.	LOCKS. Number.	Length.	Width.	Depth.	Lockage.	Total length of canal.	Height of bridges.	CANAL TOLL.
				Feet.	Feet.	Feet.	Feet.	Stat.mil's	Feet.	
1	Ohio	Cleveland—Portsmouth	152		40	4		309		
2	Miami and Erie	Toledo—Cincinnati	105		40	4		250		
3	Erie	Buffalo—Albany	110	110	18	7	655	352.18	10.5	Free
4	Oswego	Oswego—Syracuse	29	110	18	7	155	38	12	
5	Illinois and Michigan*	Chicago—Mississippi River		97.5	17.5	5		1.25		
6	Sturgeon Bay	Lake Michigan—Green Bay		515	80	16	18	1		
7	Sault Ste. Marie	Lake Huron—Lake Superior	1	270	45	14	45	8.75		24c per regist'd ton
8	Lachine	Montreal—Lachine	5	200	45	9	82.5	11.25		"
9	Beauharnois	Melocheville—Valleyfield	9	200	55	9	48	11.5		"
10	Cornwall	Cornwall—Dickinson's L'nding	7	200	45	9	29.63	12.38		"
11	Williamsburg (Farran's Pt., Rapide Plat and Galops canals).	Farran's Point—Galop's Rapids	6							
12	Welland	Port Dalhousie—Port Colborne	26	270	45	14	326.75	26.75		"
13	St. Ours Lock	St. Ours	1	200	45	7	5			"
14	Chambly	Chambly Basin—St. Johns	9	118	23.5	7	74	8		"
15	St. Anne's Lock		1	200	45	9	2	0.125		"
16	Carillon		2	200	45	9	12.5	0.75		"
17	Grenville		5	200	45	9	45.75	5.75		"
18	Rideau	Ottawa City—Kingston	47	134	33	5	282.25 rise 164 fall	126.25		"

*To La Salle, Ill., locks will pass vessels of 75 feet beam, 320 feet length and 6 feet draft.

The above information was obtained from the following sources:

1 and 2. Fifty-first annual report of board of public works, Ohio, 1889, pages 26 and 27.

3 and 4. New York state engineer's report, 1890, page 9.

5. Data received from Capt. Marshall, U. S. engineer office, Chicago.

6. Lake survey chart No. 35. [page 74.

7. Annual report, 1892, of department railways and canals, Canada, 8 to 18. "Canals and Irrigation in Foreign Countries," 1891, page 52.

The feasibility of utilizing inland waterways from Washington to New York in case of emergency has again been demonstrated. The distance is 350 miles and the torpedo boat Cushing made it last week in 28½ hours without any difficulty. The Cushing is 137½ feet long, 15 feet beam, about 92 tons displacement, 5½ feet draft, and fitted with twin screws driven by quadruple expansion engines. Her route of travel was 90 miles down the Potomac river, 110 miles down Chesapeake bay to Chesapeake city, 14 miles through the Chesapeake and Delaware canal, 55 miles on the Delaware river to Bordentown, N. J., 44 miles through the Delaware and Raritan canal and 37 miles in the Raritan river, Raritan bay and the upper bay of New York. The canals have about 9 feet of water, with locks 252 feet long and 50 feet wide, and the locks only detained the Cushing about three minutes each.

Leading in Iron Ore, Pig Iron and Steel.

A speech recently delivered by Senator Matthew S. Quay of Pennsylvania on the tariff takes up fifty-five pages of the Congressional Record, and contains a great deal of valuable statistical matter regarding the iron and steel industry. The following table, showing the lead which the United States has gained over other countries in the principal branches of the iron business, is taken from Mr. Quay's speech:

COUNTRIES.	IRON ORE. Years.	IRON ORE. Tons.	PIG IRON. Years.	PIG IRON. Tons.	STEEL. Years.	STEEL. Tons.
United States	1890	16,036,043	1890	9,202,703	1890	4,277,071
Great Britain	1890	13,780,767	1890	7,904,214	1890	3,679,043
Germany and Luxemburg	1890	11,406,132	1890	4,658,451	1890	2,161,821
France	1887	2,579,465	1890	1,962,196	1890	717,975
Belgium	1889	202,431	1890	787,836	1890	221,296
Austria and Hungary	1890	2,200,000	1890	925,208	1890	499,600
Russia	1890	1,768,097	1890	912,290	1890	372,625
Sweden	1891	987,405	1891	490,913	1891	172,778
Spain	1890	5,788,743	1890	179,433	1890	63,011
Italy	1890	220,702	1890	14,346	1890	107,676
Canada	1890	68,313	1890	19,439	1889	24,887
Other countries	1890	2,000,000	1890	80,000	1890	5,000
Total		57,038,098		27,137,129		12,302,779
Percentage of United States		28.1		33.9		34.7

The figures are generally for the years of largest production in each country. Tons of 2,240 pounds are used in giving the production of the United States, Great Britain, Canada and "other countries," and metric tons of 2,204 pounds are used for all the continental countries of Europe. It has not seemed to be necessary to reduce all tons in the table to a common standard.

The Captain's Dream.

There died recently at East Jordan, Mich., says an eastern paper, a man, the sunshine and shadows of whose life were intermingled with a peculiar fulfillment of superstitious prophesy, the loss of his vessel in a collision, and death of his mother following a dream announcing the fact. His own death came after a deep sleep that had haunted him for years. All make up a peculiar and strange combination of related facts and superstitions.

Capt. James Ward was born in Nova Scotia sixty-eight years ago. He left the land of his birth at the age of seventeen, after learning the hardships of sailing the perilous coast of his native land, and secured work as a sailor before the mast on the lakes. He became well off, had a good home on the shore of Lake Erie at Port Burwell, Canada. He sailed for forty years his own and other vessels, and had the reputation of being even reckless about the weather; but his great fear was of being run into by other vessels, and that presentiment could neither be coaxed nor shamed out of him.

On the night of Sept. 20, 1881, while going down the Detroit river in the schooner Victor, Capt. Ward was in his berth asleep. He had a most distressing dream, that his mother was dying in far-away Nova Scotia, and that his two brothers, then long dead, were standing at his bedside. He was so troubled by the vision that he went on deck, only to see a big black boat directly ahead, which crashed into them. The Victor sank almost immediately, and the captain, with his daughter and son, narrowly escaped drowning. It was a collision with the steam barge S. J. Macy, just opposite Windsor.

Capt. Ward, upon going to the telegraph office to announce to his family the news of the accident, found awaiting him a telegram announcing the death of his mother the night before. He quit sailing at once, sold out and went to farming in Michigan, a discouraged and disheartened man. He was still haunted by his vision of trouble. He died after a lingering sickness of the most distressing sort, after lying in a deep sleep or trance for five or six days, exactly as he had feared and predicted.—Coast Seamen's Journal.

The Canadian Greyhounds.

Although there is as yet no certainty of a company being organized with sufficient capital to build Atlantic steamships for the proposed Canadian line to Southampton or Liverpool, English journals at hand contain a description of the new boats, of which there are to be four. According to the plans the boats are 572 feet in length, 62 feet beam and 42 feet depth in hold, with a load draft of 30 feet, making them the deepest vessels afloat. They are 2 feet deeper than the Cunard liner Lucania. This great depth is rendered possible by the fact that the Canadian and English harbors have deeper waters than the harbor of New York. The greater depth of the new steamers allows of a stronger hull, and will give better results in a seaway and also assist in the development of speed. The freight carrying capacity of the steamers is fixed at 3,500 tons each in addition to a coal bunker capacity of 3,000 tons. Each vessel will accommodate 300 saloon, 200 second cabin and 1,000 steerage passengers. The engines are to be of 21,000 horse power, and they will drive the vessel at a speed, of 20 knots per hour in ordinary weather.

Chamber of Commerce Excursion on the North West.

On one of the excursions given by the Northern Steamship Company in celebrating at Cleveland the inauguration of the Northwest, the members of the chamber of commerce were invited. Introducing W M. Day, who was to make the address of the occasion, President Allen said that it was not fitting that one occupying the position of president of the chamber and a member of the firm who built the boat should make the address. Mr. Day said that the members would go Leonidas one better by being willing to hold an annual pass for the steamer, while Leonidas held a pass for a few days. He stated that about the time the keel was being laid for the North West the business men of Cleveland were engaged in a similar task, that of building the ship Chamber of Commerce, which he added, dipped her colors to the good ship North West. He hoped that these twin daughters of the Clyde of the inland seas would realize the good fortune pictured in the lines by Longfellow.

Mayor Blee reviewed the progress of the lake passenger business. He said: "It was in those peaceful days that the first ship on Lake Erie, the Walk-in-the-Water, made her appearance in the Cuyahoga river. This ship resembled very much in appearance the Viking ship and was about the same size, but since that time how things have changed. Following the Walk-in-the-Water came the passenger steamers Griffith, City of Rochester, Sultana, Tioga, Garden City, Plymouth Rock and her sister ship the Western World, and many others, and later on came the Atlantic, Pacific, Arctic, India, China and Japan. Following these came the Queen of the West and the Crescent City, and last but not least, came the Western Metropolis and the City of Buffalo, all first class passenger steamers of their day. Many of these steamers could not enter the river on account of their size and dimensions, and the city was obliged to build piers out into the lake on which to land passengers to and from the steamers plying between Buffalo, Milwaukee and Chicago and Lake Superior ports, and touching at the village of Cleveland whenever they had a stray passenger to land, and strange to say but few of these elegant boats ever paid a dividend, simply because Cleveland had not then taken in Newburg, Ohio City, West Cleveland and Brooklyn and had not became the Greater Cleveland."

In response to the presentation of finely engrossed resolutions complimentary to the steamer, its owners and builders, by the chamber of commerce, Mr. F. P. Gordon replied, thanking that body, and stating that he hoped to meet them again in still finer quarters on the sister ship North Land.

Pilot Chart of the Great Lakes.

The hydrographic office. navy department, has issued the pilot chart of the great lakes, which has been talked of for some time past. It is a complete map of the lakes on which are marked all harbors of importtance as well as islauds, lights, etc. The chart also contains brief rules for the use of oil to protect vessels in stormy waters, Canadian storm signals, United States weather and temperature signals, a drawing indicating location and length of St. Lawrence river canals and an article treating of variation and deviation of the compass. The North Atlantic pilot chart is issued monthly, but it is not intended to publish the lake chart at stated periods. The question of weather is not dealt with at all in the lake chart.

Commander C. D. Sigsbee, U. S. N., chief hydrographer, says of the chart:

"While there is considerable information on the new pilot chart it must be considered only an initiative. What we want now are suggestions from the people of the lake region relative to what they would like on the chart. Pilot charts are essentially cooperative charts relative to which mariners are expected to help each other, the hydrographic office and its publications providing the instrumentalities for the purpose. Suggestions are invited tending to improve the chart, both in respect to new features and to the extension of features already presented. We have ready for the press, also, a sailing directions for Lake Superior, the first of a series of sailing directions of the great lakes which we intend to publish. Unfortunately I find that the amount of our appropriation for the current year remaining due will not enable us to publish the new sailing directions until the new appropriation becomes available in July."

Five Thousand Horse-Power.

Mr. Miers Coryell and Mr. F. P. Gordon of the Northern Steamship Company both claim that a speed of 24 miles an hour will be developed in the big passenger steamer North West when she is given a trial under conditions suited to high speed. Although no thorough test of the boat's twin-screw-quadruple engines has been made on the several excursions out of Buffalo and Cleveland during the week, some cards were taken on the trip from Cleveland to Buffalo, and they show an excellent performance, but as it is intended to make a complete technical test of the machinery later on it is not thought desirable to publish these indicator diagrams at present. The cards from one engine were taken at ninety-eight and from the other at 100 revolutions, and at this speed they developed something more than 5,000 horse-power. The engines have worked to the satisfaction of the supervising engineer, Mr. Richard Peck, and on all of the trips thus far the steam has been sufficient to dispense with the use of a number of the Belleville boilers.

On a return trip to Cleveland Monday morning the engine speed was at one time increased to 110 revolutions. At 105 revolutions on this trip the log showed a speed a little better than 20 miles an hour.

The North West will return to Buffalo on Friday or Saturday of this week from Detroit. The excursions planned for Milwaukee and Chicago have been abandoned, on account of the small pox scare at Chicago. The war department officials have invited the managers of the Northern company to have their boat open the Hay lake channel next month.

In General.

Commenting on a circular issued to boom stock subscription for a steamship, Fairplay of London says: "It is becoming a very important question to many managers of steamers, looking to the enormous mass of tonnage which will be in the water by the end of the year, how any dividends are to be made at all, even on vessels belonging to old established lines possessing certain connections." From this it would seem that depression in shipping is not confined to the lakes.

The sea-going torpedo boat Forban, now building at Havre by Augustin Normand & Co., is designed to attain the speed of 30 knots, or 34½ statute miles an hour. The Chevalier, a torpedo boat of the same length, but of only 2,700 indicated horse power, while the Forban has 3,200, was recently delivered by M. Normand, and has attained a speed of 27.22 knots. The boilers which give these striking results are a specialty of the firm, and are, it is understood, to be adopted for the new British torpedo boat destroyers Janus, Porcupine and Lightning and Rocket, Shark and Surly.

The torpedo boats Cushing and Stiletto successfully stole into Newport harbor recently without being detected by the torpedo station searchlight. The incident is regarded as a remarkable naval feat, and much to the credit of Lieut. E. E Fletcher; in command of the Cushing, and Lieut. Roy C. Smith, in command of the Stiletto, inasmuch as the officers of the station were warned, and made a special attempt to find the boats. Admiral Gherardi notified Capt. Converse that the boats would try to run in between 9 and 9:30 o'clock on their return from New York. The color of the Cushing had been changed to deceive the station officer, but the Stiletto was still dark green.

The naval board of inspection and survey reported upon the Marblehead May 5, 1894. Her trial took place May 1. The two hours full speed trial at natural draught was under the following conditions: Mean indicated horse power, main engines, 2,849.1; auxiliaries, 116.4; total, 2,965.5; coal per hour, 6,097 pounds; coal per I. H. P. per hour, 2.06 pounds; average steam pressure, throttle open 1 hole, 152.5 pounds; average vacuum in inches of mercury, 24; revolutions, starboard engine, 147.75; port engine, 147.05; mean, 147.4; speed per patent log per hour, 17.3 knots; speed per calculation, assuming 10 per cent. slip, 15.71 knots.

The torpedo boat Ericsson was launched at Dubuque, Iowa, May 12, in the presence of several thousand persons. The principal dimensions of the Ericsson are: Length on normal load water line, 150 feet; breadth, 15½ feet; normal draft amidships, 4¾ feet; normal displacement, 120 tons. the indicated horse power will be 1,800, which is expected to give her a minimum speed of 24 sustained knots. The boat will have an unusually large coal capacity for her size. She is expected to make fully 25 knots, the contract speed being 24 knots. The motive power consists of two sets of quadruple-expansion engines of the vertical-inverted, direct-acting type, operating twin screws of manganese bronze.

Some time ago there was considerable controversy in a lake collision case as to the suction of propeller wheels. The following from the Army and Navy Register will be interesting to those who took but little stock in the matter: "The navy department has received the details of an accident which occurred at the Norfolk navy yard. While the Texas was undergoing her dock trial a schooner was sucked into the vortex caused by the revolutions of the Texas' propellers. The propeller struck the schooner, ripping out a piece of its bottom and sinking it. The department has not yet been advised whether or not the propeller was injured. The crew of the schooner escaped unharmed."

Transport says that it is surprising what a large proportion of the American coastwise trade is now done by barges, towed by powerful tugs and steamers. Six, and sometimes seven barges, carrying 1,700 tons of coal each, often leave Philadelphia for New England ports in tow of a single steamer, which herself carries 2,000 tons in her hold. They take back ice or railroad ties, and sometimes even go to Cuba for barge loads of sugar. The Boston Towboat Company is one of the concerns that has made a good showing in this business. With a capital of $1,000,000 it earned about 12½ per cent. on its stock during the year ending March 31, and charged half to depreciation, though it carries insurance. The net earnings were $125,857, of which $60,000 was distributed to share holders. This did not include $8,000 earned in an ineffective attempt to salve the wreck of the Kearsarge.

The Graduation of Engineers.

The classification of working or of operating engineers comprises those who take charge of marine, locomotive or stationary engines. The marine and the locomotive engineer, especially the former when in ocean service, has, or is supposed to have a great deal more than smattering knowledge and superficial skill. His position differs from those of the other two because when at sea he has to be entirely self relient upon his own knowledge, practical experience, ingenuity and manual skill. We had more than two or three cases last year, where presence of mind and mechanical ingenuity on the part of marine engineers not only enabled the captains of steamships to bring their vessels safe into port, but also were the means of saving the ship from serious disaster, and the owners from aggravated expense. It must be remembered that the marine engineer, in case of irregularities, leakage or breakage has to fall back upon the appliances and materials in the engineer's department or on the ship's supplies. There is no r und house or repair shop to rely upon.

The graduation of engineers is something that the nature of the occupation requires. If a man selects to be an engineer, and is ambitious enough to become skilled and experienced, he should be willing to commence at the foot of the ladder—in the round house as a wiper, in the engine room as an oiler, in the furnace room as a fireman, in the repair shop as a machinist's helper, or in the engineer's department as an assistant. Today, our steamships, locomotives and steam plants are getting to be more and more complicated; there is a great deal more attached to them than formerly, and with them must move in parallel lines, greater intelligence, more knowledge and a wider experience; and if a man has neither facilities nor opportunities, nor means to get a technical education at some of our institutes, there is the other line to follow, namely, the line of graduation, commencing at the bottom and building up steadily and perseveringly a practical experience that will qualify him for positions of high responsibility.

Colleges of engineering, institutes of technology, trade schools, engineer's associations, engineering papers and magazines are all for and with the engineers of today; they are all magnificent helps—strong, reliable stepping stones which with practical experience make graduation available and possible for all.—Stationary Engineer.

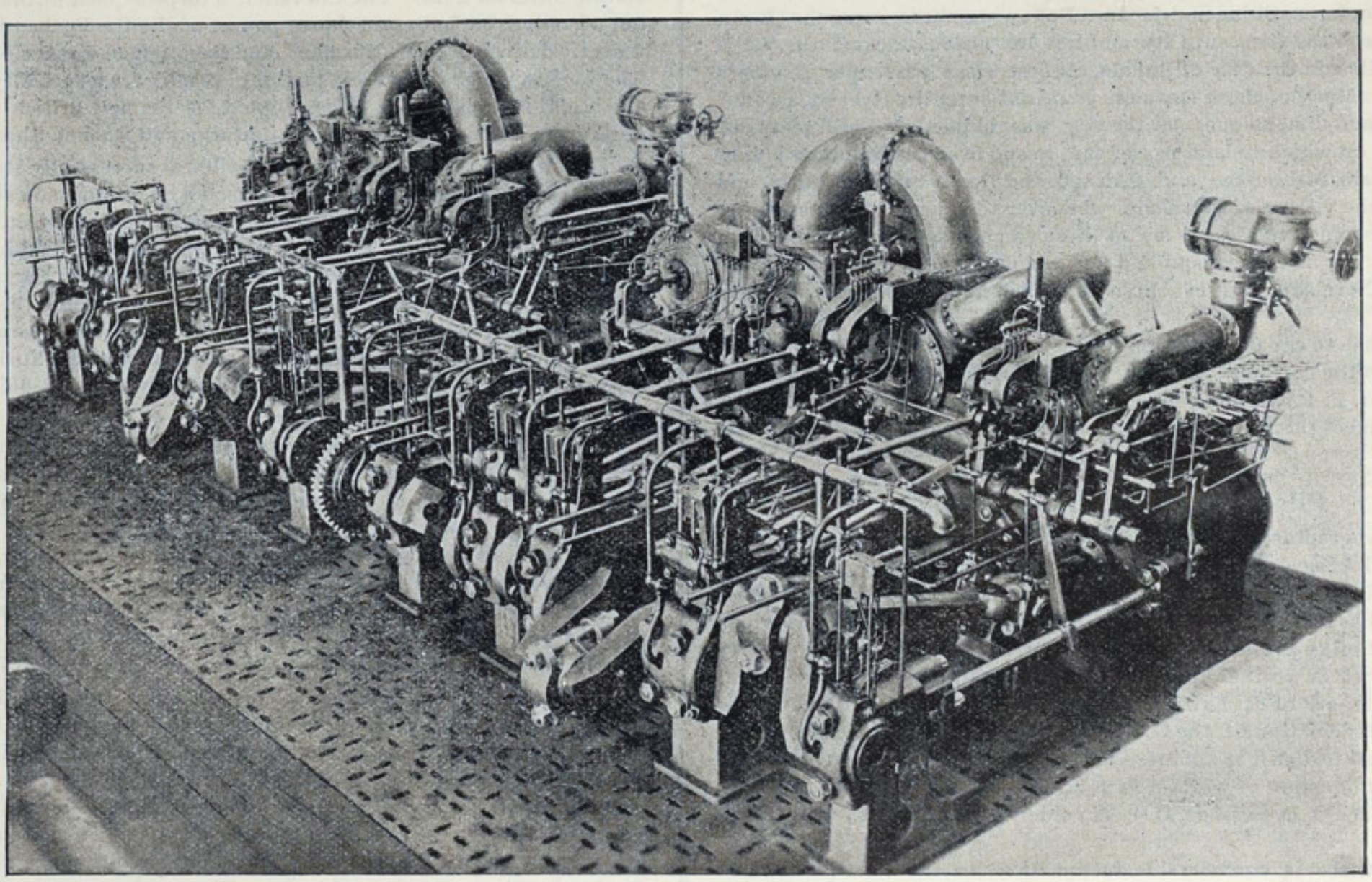
The action of the Anchor Line and Western Transit Company in conducting a patrol of the beach in the vicinity of Point au Barques, Lake Huron, to keep a lookout for any bodies that might come ashore—that being the scene of the Philadelphia-Albany collision last fall—is commendable. As much is, of course, to be expected from all vessel owners, but it was pleasing to see these companies take action voluntarily at a time when the accident was almost forgotten by those not interested, but there were prospects of recovering the bodies, on account of heavy weather.

Books of the patent office show more than 200 patents taken out for various forms of screw propellers.

Engines of the Harbor Defense Ram.

The illustration on this page shows the horizontal triple expansion engines of the harbor defense ram Katahdin, an entirely new type of vessel for naval warfare. It is expected that the Katahdin will leave on her trial trip very soon. She was launched at the Bath Iron Works on Feb. 4, 1893. Her length, extreme is 243 feet; length on water line, 242 feet 9 inches; breadth, 43 feet 5 inches; breadth at water line, 41 feet 10 inches; draught of water, 15 feet; displacement, about 2,050 tons. The thickness of armor in conning tower is 18 inches; thickness of deck armor at side, 6 inches; thickness of deck armor at center, 2 inches; thickness of armor of smoke pipe and ventilators, 6 inches. The vessel is constructed with a double bottom, the entire length of the ship, 2 feet between the skins, and divided into numerous separate cells. The framing is on the longitudinal system, and great strength is given to the structure by the longitudinals and girders being continuous from stem to stern. The depth of the longitudinals throughout their length is 24 inches, and the girders which support the armor deck are 15 inches in depth.

The transverse frames within the double bottom are intercostal brackets. The vertical keel, four of the longitudinal frames and the armor shelves are to be water tight; also the transverse frames, about every 20 feet, are to be water tight; thereby the space between the outer and inner shells is divided into about 70 water tight compartments. The vessel



ENGINES OF THE HARBOR DEFENSE RAM KATAHDIN.

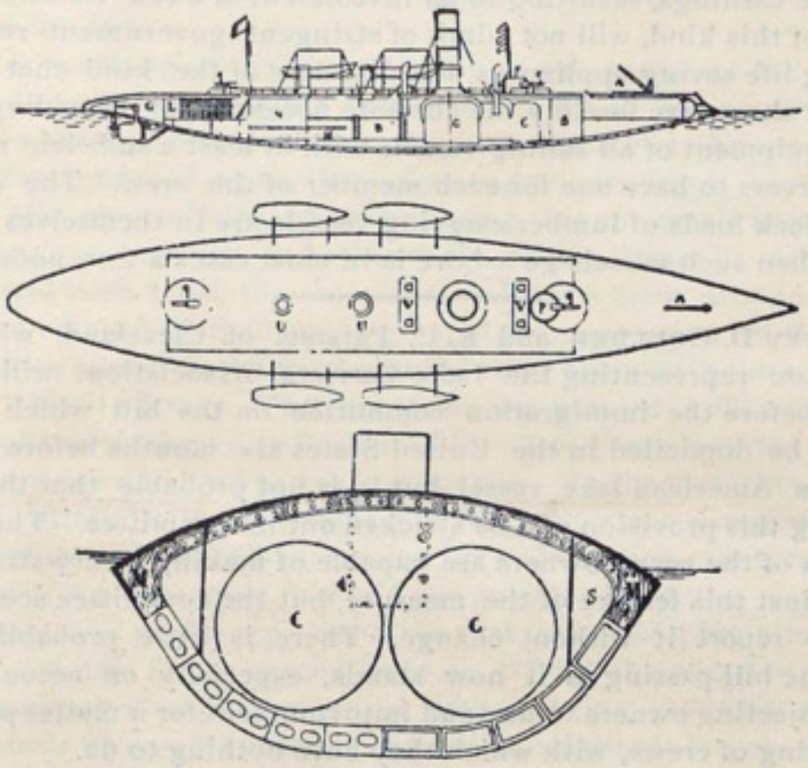
above the inner skin is divided by transverse and longitudinal bulkheads into 30 water tight compartments, making in all about 100 water tight compartments. All hatches through the armor deck are to have battle plates of thick armor. She is to be lighted by electricity, and submerged to the fighting trim by means of Kingston valves in the different compartments. Artificial ventilation is to be on the exhaust system. The vitiated air is to be drawn by fans; the fresh air to be supplied through ducts connected to the armored ventilators

The propelling engines will be placed in water tight compartments, and separated by an athwartship bulkhead. They will be of the horizontal, direct acting, triple expansion type, each with cylinders 25, 36 and 56 inches diameter by 36 inches stroke; indicated horse power about 4,800, at 150 revolutions per minute. The main valves will be of the piston type worked by Marshall valve gear. There will be one piston valve for each high pressure and each intermediate cylinder, and two for each low pressure cylinder. The bed plates and cylinders will be secured together by forged steel tie rods, and supported on wrought steel keelson plates built in the vessel. All crank, line, thrust and propeller shafting will be hollow. The shafts, piston rods, connecting rods and working parts generally will be of forged steel. The condensers will be made of composition and sheet brass. The air and circulating pumps will be independent. The propellers will be of manganese bronze or equivalent metal. Each engine room will have an auxiliary condenser with combined air and circulating pump.

There will be two double-ended boilers, 13 feet 8 inches diameter by

22 feet 6 inches long, and one single-ended boiler, 13 feet 8 inches diameter by 11 feet 7 inches long, for a working pressure of 160 pounds per square inch. They will be placed in two water tight compartments, and will have one smokepipe. Independent boiler feed pumps will be placed in the fire rooms. The forced draft system will consist of two blowers for each fire-room, which will be air tight. There will be steam reversing gear, ash hoist, turning engines, auxiliary pumps, engine room ventilating fans, distilling apparatus, engineers' workshop, etc.

The Katahdin was designed by Admiral Daniel Ammen and several features were suggested by the monitors used in the late war. He had in



his original plans a ram independent of the ship's hull and capable of being detached without danger the moment the enemy's ship was struck. The navy department could not find the means of carrying out this plan, and the spur was adopted. This spur is a steel casting. It weighs about 11 tons and its height is 10 feet and 9 inches. It is supported by the stem, the armor fastenings, the keelsons, which tie the ship longitudinally, and the horizontal bulkheads. Its union with these different parts is so studied that the reaction of the ramming is distributed over the entire hull of the ship. In her fighting trim the target is only a rounded surface about 250 feet long and rising but 5½ feet from the water line. There will be practically nothing but the smoke-stack to aim at.

Masters and Mates must pay Higher Fees.

Special Correspondence to the MARINE REVIEW.

KINGSTON, Ont., May 24.—Sir Charles H. Tupper has introduced in parliament a resolution providing that the governor-in council may establish the following scale of fees to be charged for certificates to masters and mates: For a certificate of competency as master, $15; for a certificate of competency as mate of a sea-going ship, $8; for a certificate of competency as mate of a ship trading on the inland waters of Canada, or on the minor waters of Canada, or on coasting voyages, $6; for a certificate of service as master, $8; for a certificate of service as mate of a sea-going ship, $5; and for a certificate of service as mate of a ship trading on the inland waters of Canada, or on the minor waters of Canada, or on coasting voyages, $4. The minister of marine explained that the rates were increased as the fund connected with this service was $41,000 in debt.

Lord Aberdeen, governor-general of Canada, has invested $2,000 in one of the electric launches which plied on the lagoons at the world's fair last year.

Fault Connected with the Chicago Disasters.

CHICAGO, Ill., May 24.—All Chicago has been excited over the great loss of life among sailors off the harbor, and everyone has come in for some criticism from the press. This criticism, first made by young men who knew nothing at all about navigation, is now being echoed in editorial thunder by writers who knew as little about the subject as did the young men on the lake front last Friday and Saturday. The revenue cutter Andrew Johnson and the harbor tugs have been most unjustly criticized. Instead of being subject to abuse, Capt. Davis, veteran commander of the Johnson is entitled to great praise for his heroic endeavors to save life on that awful afternoon. Although he knew that his boat was old and in no condition to breast the furious gale, he steamed out from behind the breakwater and faced the sea for a couple of hours in trying to do something for the crew of the Myrtle. At the outset of the disasters, Capt. Davis sent word to the captain of the life saving crew that the Johnson was at his disposal to tow the life boat anywhere she might be sent. The keeper of the station, however, took no notice of the Johnson, and called a tug when necessary to go out. When the Johnson went outside, she was unable to approach very near to the wrecked and distressed schooners, on account of the sea, and her launches would not have lived as long as they were being launched. In many respects, the Johnson would have been a better boat to tow the life boat than a tug, and had Capt. Davis been given an opportuntity, she would have done noble work that day.

The tugmen were the real heroes of the day. Among the boats which distinguished themselves were the Crawford, Mollie Spencer, J. V. Taylor, Perfection, Protection, T. T. Morford, Van Shaick and Welcome. The tugs would have done a great deal more and saved several schooners, if the tow lines on board the latter had been strong enough Frequently they broke the instant the strain was put on them in the sea and then valuable time was lost in getting the line again. Again the tow line parted, and by that time it was too late.

When the H. B. Moore dragged her anchors so that she was in danger of joining the other boats on the shore, the captain slipped his anchors, and hoisted sail and sped out into the lake. One tug captain remarked that a captain who had sand enough to sail out in that gale, would have courage to put his boat where he could walk ashore from her, and the results bore his remark out, for the H. B. Moore is now high and dry on the Indiana coast, and the crew hardly wet their feet in getting off the boat.

The fault with the life saving service here is that it was desired to make a fine showing at the world's fair last summer. There was no appropriation for maintaining a model crew at the world's fair grounds, and the expedient of removing the crew from the mouth of the harbor to the fair ground was adopted. Only two men were left at the old station, and but little attention was paid to the condition of the apparatus and boats. No particular protest was made, as Chicago was giving up everything in sight for the fair. The capsizing of a yacht on July 9, and the loss of four lives, was in sight of the old station and called attention to the vital weakness of the life saving service. No doubt a move would have been made then to have had the old station properly manned, had it not been for the fearful calamity of the cold storage fire at the fair the next day, which absorbed all public interest. After the fair was over, Supt. Kimball decided to continue the useless but magnificent station at Jackson park. Marine men predicted just what has happened. When the call came, the service fell down utterly. The life boat filled as soon as it was put in the water. The two men at the station with volunteers did the best they could, but what was then imperatively demanded was the work of trained and hardened life savers. The fault must be placed, not upon the poorly paid members of the life saving service, but at the doors of the officials at Washington.

Canal Surveys.

Again a committee of the House of Representatives has recommended an appropriation of $50,000 for a survey of a deep water ship canal route from the lakes to the Hudson river. The bill, which comes from the committee on railways and canals, is practically a duplicate of the measure introduced in the last congress, after the big gathering of representatives of lake shipping interests in Detroit (known as the Waterways Convention) had recommended such a survey. No special route is recommended. Some very hard work on the part of members interested in the survey will be required in order to secure consideration of the bill in the house and obtain the appropriation necessary for the work of the army engineers. Unfortunately the committee also recommended a survey for a canal between Lake Erie and the Ohio river, and this recommendation, with the appropriation which it proposes, will be a drawback to the more important measure providing for estimates on the outlet to the seaboard. As has been stated many times by practical men engaged in lake commerce, the Pittsburg and Cincinnati projects for canals to Lake Erie would be certain to result in failure commercially, and lake representatives in congress should dismiss them as impractical and devote their attention to the proposition for a survey from the lakes to the Hudson if the canal committee's recommendations are given a hearing in the house.

A Whaleback Yacht.

The Galveston News tells of an odd yacht recently shipped to the gulf from the interior of Texas. She is to take part in yacht races on Galveston bay next month, and is such a pronounced departure from anything in the way of a boat ever seen in that part of the country that a great deal of interest is shown in her. She is about 32 feet in length by about 6 feet beam. There are no straight lines and the boat is of the shape of a large cigar, pointed at the forward end, with a whaleback extending from the forward part to about 15 feet aft, and she is claimed to be in all respects absolutely insubmergible. Air chambers are fitted inside and her forward bulkheads are air tight. She has a centreboard which is very heavy, being of iron heavily weighted with lead, and her rudder is massively constructed. She draws only two feet amidships and will have but little resisting power, compared with other yachts, when being propelled through the water. The rig is of the lugger kind, and it is understood that but one man will be required to sail her.

"ROPER'S LAND AND MARINE ENGINES," BOUND IN MOROCCO WITH FLAP AND POCKET, WILL BE MAILED TO ANY ADDRESS FOR $3.50 SENT TO THE MARINE REVIEW, CLEVELAND, O.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department contain the names of 3,761 vessels, of 1,261,067.22 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1893, was 318 and their aggregate gross tonnage 525,778.57; in all other parts of the country the number of this class of vessels was,on the same date, 211 and their gross tonnage 314,016.65. The classification of the entire lake fleet on June 30, 1893, was as follows:

Class.	Number.	Gross. Tonnage.
Steam vessels	1,731	828,702.29
Sailing vessels	1,205	317,789.37
Canal boats	743	76,843.57
Barges	82	37,731.99
Total	3,761	1,261,067.22

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
1892	169	45,168.98
1893	175	99,271.24
Total	991	471,891.97

ST. MARY'S FALLS AND SUEZ CANAL, TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1893	1892.	1891.	1893.	1892.	1891.
No. vessel passages	12,008	12,580	10,191	3,341	3,559	4,207
Ton'ge, net regist'd	9,849,754	10,647,203	8,400,685	7,659,068	7,712,028	8,698,777
Days of navigation..	219	223	225	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

THE publication, this week, of a pilot chart of the great lakes by the hydrographic office, would indicate that it is the intention of that branch of the navy department to give considerable attention to the distribution of information that may prove interesting to lake mariners. One of the appropriation bills now before congress provides for a branch office of this service at Cleveland, in addition to the one already established at Chicago, and other plans outlined by the officers of the service will require the expenditure of considerable money for a purpose entirely new to the lakes. As we have said before, it is not our intention to discourage any work on the part of government officials that may lead to practical benefits in lake navigation, but a lavish expenditure of money in elaborate maps, tabulated printed matter, reports of bottle experiments,etc.,much of which is duplicated between the light-house board, weather bureau and hydrographic office, may leave these bureaus open to the criticism that they are aiming mainly to provide employment for a surplus of officers. In the chart in question, however, there are a number of very good features, notably some information on compass variation and deviation. On the subject of compass variation on the lakes the naval officers in the hydrographic service can certainly render valuable assistance to most lake masters.

THERE have been no notable instances where engineer officers of the army engaged in harbor work on the lakes have been interfered with or dominated by politicians, and in the interest of successful prosecution of such work it is to be sincerely hoped that removals of officers under conditions like those mentioned below will not be permitted. The Louisville Evening Post makes the following complaint: "The government sends an army officer to Louisville and places him in charge of the work on the canal, but the politicians will not permit this officer to select his own subordinates or make appointments solely for professional reasons. Already this struggle between politics and business has resulted in the removal of one army officer to another post, and now Major Handbury is to repeat the experience of his predecessor. The interest of commerce requires that this great public work be placed in the hands of men professionally fitted to construct and to conduct it properly and economically. The interest of hard-pressed politicians requires that they be given full permission as they please to remove and appoint men to positions on the canal, regardless of anything except their power of serving these same politicians."

IN all the reports of the great loss of life on Lake Michigan during the storm of a few days ago, there was not a single instance in which mention was made of the use of a cork jacket of any kind. This is not surprising. Even a single cork ring on deck, to be used in case of a man falling overboard, is not to be found in some of the uninsurable old hulks engaged in the lumber trade out of Chicago. Of course, these worn out old schooners are owned largely by men who risk their own lives in them, and whose earnings, resulting in an investment of a few hundred dollars in boats of this kind, will not admit of stringent government regulations regarding life saving appliances, but disasters of the kind that occurred this week show very forcibly the absolute necessity of providing by law for the equipment of all sailing vessels with at least a sufficient number of life preservers to have one for each member of the crew. The argument that the deck loads of lumber-carrying vessels are in themselves life preservers when such vessels go ashore is in most cases a very poor one.

HARVEY D. GOULDER and R. C. Parsons of Cleveland, who are in Washington representing the Lake Carriers' Association, will secure a hearing before the immigration committee on the bill which requires sailors to be domiciled in the United States six months before they can ship on an American lake vessel, but it is not probable that the section containing this provision will be stricken out in committee. These representatives of the vessel owners are capable of making a very strong argument against this feature of the measure, but the committee seems determined to report it without change. There is little probability, however, of the bill passing as it now stands, especially on account of the clause subjecting owners to fine and imprisonment for a matter pertaining to the hiring of crews, with which they have nothing to do.

SENATOR McMillan has given notice that when the civil Sunday appropriation bill comes up for consideration in the senate he will ask for amendments providing appropriations for more of the aids to navigation on the lakes that have been authorized by previous acts of congress. He has specified among amendments lights for Port des Morts passage and North Maniton island and will probably propose other changes before the bill is considered a few weeks hence. This action on the part of the senator from Michigan is entirely in accord with the views of vessel owners in all parts of the lakes, who, although not desirous of creating sectional feeling in the matter of appropriations of this kind, have been compelled to call attention to the very large appropriations in this bill for the improvement of southern rivers, as against a few thousand dollars for lights and fog signals on the lakes.

WHEN it was learned, shortly after the close of the World's Columbian Exposition, that the officers of the life saving service had concluded to continue the elaborate station at Jackson park, Chicago, and provide only a couple of men for the old station, the REVIEW called attention to the danger of depending upon life savers located eight miles away from the harbor entrance The Washington authorities decreed, however, that the show prepared for the fair should continue, as the station was an attractive one and its surroundings pleasing to look upon. But a dozen or more lives were lost at the entrance to Chicago harbor a few days ago, and it is openly charged that the loss would not have been so great if the station at the harbor had been properly equipped.

VESSEL OWNERS who know Henry Howard of Port Huron were not surprised by his action toward Capt. Little who lost the schooner William Shupe on Lake Huron during the recent blow. Capt. Little purchased the Shupe from Mr. Howard, giving in payment notes secured by a mortgage on his farm. After losing the boat and narrowly escaping death with his entire crew, Capt. Little would have been penniless, but Mr. Howard returned the notes to him and cancelled the mortgage. Henry Howard would have been in congress from the Port Huron district long ago but he is not the kind of man to mingle with or control working politicians.

SENATORS from Minnesota and Wisconsin will seek an amendment to the river and harbor bill modifying the raft towing regulations as far as they relate to harbors at the head of Lake Superior, where it is admitted that the annoyance to vessels is not so great as in the long tows through the rivers. They seem disposed to meet the vessel interests half way in the matter, and as conditions in their districts lend additional force to their arguments, success is not impossible with them.

ON April 1, 1894, there were, not including war ships, 414 vessels under construction in the United Kingdom, the gross tonnage aggregating 725,208. The steam tonnage amounted to 663,396, and the sailing tonnage to 61,812. As compared with the same period last year, there is an increase of about 128,000 tons in the steam tonnage and a decrease of 25,000 tons in the sailing tonnage, the net increase being 103,000 tons.

A Lesson in Ship Canals.

In the April number of the Cosmopolitan is an article, "The Romance of the Great Canal," by G. T. Ferris. In view of the numerous ship canal schemes, feasible and unfeasible, that are being hatched every few months, the article has a local interest in addition to information about the Suez that it contains. It is shown that estimates for such works are pitifully minimized, and that all kinds of jobbery is made possible by the magnitude of the work. The human sacrifice that resulted from the employment of fellaheen labor under a tropic sun would not be possible in a civilized country, but the moral in the story to ship canal enthusiasts is to count the cost.

After speaking of the financial ruin of the promoter the writer says: "M. de Lesseps had got his concession. But it was another thing to raise two hundred million francs, the sum supposed to be needed, according to the figures of a magnificently sanguine engineer, to cut the great ditch. One may anticipate here by saying that the actual cost was a little less than four hundred and seventy-six million francs." After every resource had been tried, the amount raised was a mere drop in the bucket. The ease with which Said Pasha granted the concession led the engineer-financier to appeal to the good natured ruler again with the result that he loaned 2,394,914 francs. The concession was granted in 1854, and subscription books were opened in Paris in 1858. Two years later the concessionaires were down to hard pan as to resources. In the meantime their greed was not satisfied with the prospect of the prospective revenues of the main canal, but they obtained a concession for an irrigating canal on easy terms. Said Pasha was the goose that laid the golden eggs at the command of M. de Lesseps, and on the representation that he was helping himself he subscribed and paid for, or agreed so to do, 177,662 shares out of 400,000, the total company stock, the nominal amount being 17,764,200 francs. "In other words he entered into obligations to contribute largely to the building of an enterprise in which he was originally to have been a partner as payment for the concession. This magnificent subscription at the head of the Paris books dazzled the public eye and fresh capital at once began to pour into the company coffers. But Said was a pauper in cash.

"The suave Frenchmen, however, were at no loss for an expedient. They said His Highness's obligations would do. European Shylocks would readily discount them. They took the shape of treasury-warrants bearing interest at ten per cent. and payable in four annual instalments, the first due in December, 1863. These bonds, in their total, amounted with interest to, 24,705,734 francs, for which the viceroy was assigned a little more than two-thirds value in canal-bonds. This was irrigation with a vengeance, and company interests began to blossom in the European money-markets, as the work progressed. Said died in 1863 and was succeeded by his nephew Ismail, a prince of immense private fortune. Here was unexpected fatness, and the impecunious canal managers, reduced again to the last piaster, beat their brains for a device whereby to fasten rapacious talons on the treasure-trove. They assured Ismail that one of the sweet water canals was needless. They feared that dispute over jurisdiction of property on its banks would cause endless domestic trouble in Egypt. They would generously retrocede their claim (!) in this particular, if the khedive, which title had been adopted by the new viceroy, would agree to complete the other sweet-water canal at his own cost, the company retaining all rights of property and usufruct. The colossal impudence of this suggestion was its best guarantee of success.

"The forced labor, the workmen, some under fourteen, being driven to work by whips, and poor food caused the wretches to die like flies. This came to the attention of John Bull, who had been watching anxiously this short cut to India. He appealed to the Porte to nullify the concession, but a compromise was made by ordering the khedive to discontinue the use of the corvees. Here was now the hook on which a fat grievance could be hung. The khedive was made responsible for the action of Turkey, though its endorsement was an essential clause in the Said concession. The French journals in the pay of the canal raised a furious outcry, ignoring the fact that Egyptian labor had been optional with the khedive. They branded any withdrawal of the fellaheen as a fatal violation of contract, treating that as an iron-bound agreement, which had never been more than a concession. The canal party beat their drums and tom-toms without ceasing and clamored that, without forced Egyptian labor, the enterprise was ruined. The audacity of this plea may be appreciated in the facts that water was rushing into the canal now in floods, that the engineering conditions made steam machines indispensable, and that a large outfit of dredges was surreptitiously stored in France, waiting order for shipment. Most of the fellah labor would in any case soon become useless. The canal-managers figured a portentous schedule of damages and asked Ismail to settle. The Egyptian ruler protested and argued, but the vampires would not loose their grip. The dispute increased in violence and became the talk of Europe. Ismail dissembled with a haughty front, but he was already beginning to quake. So he consented that the French emperor should arbitrate the issue. Whether or not he knew that M. de Lesseps was blood-kin to Eugenie, and armed with irresistible back-stair influence, one can only conjecture.

"Napoleon's verdict allowed the canal company more damages than it claimed. He assessed the loss to the company at 38,000,000 francs stating that as the amount necessary to finish the canal with labor-saving machinery, which had been purchased and was ready for shipment, and was the only thing that could be used because of the inflow of water. Other counts were made so that the khedive was mulcted of 84,000,000 francs. The success of the company in holding up the Egyptian made them blood-thirsty, and they hatched up other grievances until they got 40,000,000 francs more. But the khedive was bankrupt, so they took his coupons running down to 1895, the face value of which was 125,000,000 francs. It is estimated that this canal, which was to have been excavated free of charge to Egypt, has cost that country 500,000,000 francs. Notwithstanding all this, the khedive celebrated the inauguration of the canal, Nov. 20, 1869, by turning Cairo into a fairyland for a month, at a cost of $21,000,000. It is said to have transcended the wildest dreams in the 'Arabian Nights.'"

The Story of the Late Storm.

The story of the storm that passed over the lakes last week is portrayed in a bulletin issued by the United States weather bureau. Observers at different lake ports have a few copies of this bulletin, which they will furnish to those who apply for them. If the atmosphere is looked upon as a great sea, and it is considered that waves of marvelous height and depth move over this sea, a slight realization may be had of the power manifested by a storm. On the evening of May 15 cautionary signals were ordered on all the lakes. At this time the storm area was central in Montana. Its chief peculiarity was the slow rate at which it traveled. The usual speed is 25 miles per hour, but 15 miles was the rate for this storm. On the morning of the 17th the area of low barometer was central in Minnesota. To show the circling motion of storms the direction of the wind is given at several places: Duluth, N. E.; Rapid City, N. W.; Sioux City, S. W.; Des Moines, S; Detroit, E. The area affected was almost 2,000 miles long by 1,000 miles wide. The barometric pressure on the 17th, at the storm center was 29.5 and on the 18th, 29.6. On the evening of the 17th the storm area was central over the southern end of Lake Michigan, and had become concentrated. The wind was blowing 36 miles an hour at Chicago, Milwaukee and Port Huron, all north and northeast, while at the same time the wind was from the southwest at Detroit. The continued northerly winds had brought down a cold wave, causing the temperature to drop from 26 to 30 degrees.

The following morning the storm had moved over Lake Erie, but the highest winds seemed to be in its wake, for it blew 52 miles an hour at Chicago during the night. Inspection of the weather maps of the 18th will show that the cold wave formed a triangle in the morning, and during the day pushed it as far south as Alabama, and made it from 20 to 30 degrees colder all over the Mississippi valley. The atmospheric disturbance did not stop with the passage of the area of low barometer, but the force of the storm had passed. Although a difficult storm to forecast, on account of its slow movement and force, it was well cared for by warnings from the weather bureau. With their opportunity for observation, their baromoters, and a little study, captains and mates ought to make the best of weather prophets. It is a peculiarly interesting study.

Launch of the Shenandoah.

Shenandoah is the name given the wooden steamer launched by James Davidson at West Bay City last week. A detailed drawing of a midship section and sectional side elevation, showing strapping, etc., of the steamer was given in a supplement to the REVIEW, April 5, 1894. These drawings show the unusual strength of construction in a way that can not be described. The engine is triple expansion, 20, 33 and 54 by 42 inches stroke, and was built by the Frontier Iron Works, Detroit, Mich. The boilers are 13 by 13 feet, with three furnaces each, which were furnished by Wickes Bros. The auxiliary machinery is of the best, the windlasses and capstans being from the American Ship Windlass Company, and the steering engine from the Globe Iron Works Company, Cleveland, O. Although the steamer was built to be run most economically, the cabins are finely furnished in hardwood, and draperies and carpeting are in keeping. She was built under the rules of the United States Standard Register, New York, and was given the highest rating by that association. She is expected to carry 3,000 gross tons of ore or 110,000 bushels of wheat on 16 feet draft.

The 29th or 30th of May is the time set for the launching of the Kearsarge, built by the Chicago Ship Building Company. This steamer was named to perpetuate the name of the U. S. S. Kearsarge lost on Roncador reef recently, and strange to remark there is no United States merchant vessel having this name.

IF YOU SEND $1 TO THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O., FOR FOUR STEEL ENGRAVINGS OF U. S. WAR SHIPS, ON HEAVY CARD, AND ARE NOT SATISFIED WITH THEM, WE WILL REFUND THE MONEY.

One of Judge Swan's Decisions Reversed.

In the suit of Wineman and others of Detroit, owners of the schooner Card against the steamer Iron Chief the United States circuit court of appeals at Cincinnati has reversed the decision of Judge Swan of the United States district court, Detroit. In July, 1891, the Iron Chief and Card collided a short distance above Round island, head of St. Mary's river, at its junction with Waiska bay and on the extreme northerly side of the channel. The owners of the Card libeled the steamer, but after hearing the case in Detroit in February, 1892, Judge Swan dismissed the libel. His statement of the case and conclusions were about as follows: "The Card, bound down with a fresh northwest wind, having failed to obtain a tug to take her into the St. Mary's river, tacked across the broad southern channel and entered the narrow northern one, rarely used by sailing vessels. The steamer Iron Chief, with the barge Iron Cliff in tow, was at the same time passing up this channel on a course about northwest. The steamer, supposing the schooner was beating up the lake, stopped to let her pass the mouth of the channel, but when she put her helm up to enter it, started ahead, taking the northern side, in order to pass port to port. The schooner lost her swing, put her helm down, and collided with the steamer and the barge. The collision was the fault of the schooner, whether caused by putting her helm down, by previous improper handling, or by failure to obey her port wheel, and her failure to hold her course excused the steamer from the duty of keeping out of her way. The schooner was in fault in needlessly taking the narrow northern channel after the steamer had entered it. She should have awaited the steamer's exit, or have taken the broad channel. When the schooner lost her swing, it was proper for the steamer to go ahead at full speed—the only possible way of avoiding the collision."

The opinion containing causes for reversal of this decision in the higher court has not as yet been given out. Attorney Wisner of Detroit represented the owners of the Card and Harvey D. Goulder of Cleveland the Iron Chief.

Trade Notes.

An illustrated descriptive account of Newcastle-on-Tyne is sent out by G. Tyzack, manufacturer of the Tyzack triple-grip anchor, South Shields, England. It is quite interesting, and any reader of the REVIEW wishing a copy can procure it by sending his address to DeGrauw, Aymar & Co., No. 34 South street, New York, agents for the anchor.

The side-wheel passenger steamer Priscilla and the big auxiliary steam yacht Eleanor, both of which were described in the last issue of the REVIEW, were built for classification in the United States Standard Register of Shipping. A steel twin-screw steamer for the West Indies, to be built by Neafie & Levy, and a steel screw collier for the Reading Railway Company, to be built by the Cramps, will also be built under rules and inspection of this association.

Around the Lakes.

In one day, recently, 25,000 tons of ore was loaded out of dock pockets into eleven vessels at Two Harbors.

Mr. Miers Coryell will return to London in a few days, probably to remain permanently, as he goes to act as consulting engineer with firms that are desirous of building Belleville boilers.

Official numbers were assigned two lake boats by the bureau of navigation during the week ending May 12: Sail.—Three Links, No. 145,667, 7.14 tons gross and net, Toledo, O. Steam.—L. P. Smith, No. 141,326, 73.70 gross tons, 36.85 net tons, Cleveland, O.

The type of new passenger boat to be built by the Goodrich Transportation Company is not as yet fully decided. The boat will be of steel, but Mr. Frank E. Kirby of Detroit, who has prepared plans for a side-wheel steamer, says the company may yet decide on a propeller.

Up to May 15, the movement of iron ore from mines shipping through Two Harbors was: Chandler, 55,711 grons tons; Minnesota, 45,948; Canton, 32,607; Franklin, 10,324; total, 148,954. On May 15 a year ago there had been practically no ore moved from the head of the lakes.

Capt. Wilson, who was lost with all hands on his schooner Lem Elsworth, was, as the sailors put it, his own worst enemy. He knew no fear, and by carrying big loads in the stone trade would make money with a vessel at freights that would not meet expenses if ordinary cargoes were carried.

Professor Willis L. Moore, who won the prize in the recent weather forecasting contests at Washington, has been appointed to take charge of the bureau at Chicago. It is understood that he will have supervision of the service on Lakes Superior, Michigan and Huron, the object being to systematize the work of that portion of the lakes, with a central office at Chicago.

About May 28 a fixed red light will be established on the outer end of the recently extended north pier, Racine, Lake Michigan. The light will be shown from a lantern in an inclosed glazed end of a conduit extending shoreward a distance of 288 feet to the present pierhead light tower, and will be about 800 feet to the eastward of Racine light house. With Racine light (white) the new light will guide clear to the northward of Racine reef, by keeping the white light open to the northward of the new light. On the same date the present sixth-order pierhead light, about 500 feet to the eastward of Racine light will be discontinued.

Writing of the rough experience of the Canadian steamer Clinton and consorts Grimsby and Lisgar outside Turtle island in the gale of last week, a Toledo correspondent says: "It is the general impression that not much of a sea can be kicked up at the head of Lake Erie, but several vessels have had it proven to the contrary during the past year, among them the steamer W. H. Sawyer and consorts which left here in the face of a heavy northeaster last spring and were very severely shaken up just outside the can buoy. Good anchorage can be found to the northward and westward of Turtle light, but the bottom is somewhat sandy to the eastward. The government dredge is deepening the channel near the Craig ship yard. This is a much needed improvement, as many vessels were detained there last season. The barge Mariner is sunk abreast of the Columbus coal dock. Vessels should pass between her and the dock."

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on May 19, 1894:

	Wheat, bu.	Corn, bu.
Chicago	19,205,000	3,569,000
Duluth	8,749,000	143,000
Milwaukee	1,039,000	3,000
Detroit	1,746,000	30,000
Toledo	2,625,000	41,000
Buffalo	2,056,000	519,000
Total	35,420,000	4,305,000

At the points named there is a net decrease for the week of 1,173,000 bushels of wheat and 970,000 bushels of corn.

WE ARE NOW IN POSITION TO FURNISH BROMIDE CRAYON PORTRAITS OF YOUR BOAT, 14 BY 22 INCHES, FOR $5 EACH. IT IS NECESSARY TO HAVE A PAINTING OR PHOTOGRAPH OF YOUR BOAT TO WORK FROM. IF YOU HAVE NONE, WE CAN HAVE ONE TAKEN WHEN YOU COME INTO CLEVELAND FOR $1 EXTRA. AT PRESENT WE CAN FURNISH SUCH BOATS AS THE W. H. GRATWICK, (STEEL), THE NORTH WEST, VIRGINIA, (NIGHT SCENE), THE CITY OF DETROIT, PONTIAC AND MANY OTHERS. WRITE US ABOUT IT. MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O.

A BASE BALL SCHEDULE of the National League will be mailed free to any address on application to the General Passenger Agent of the Nickel Plate road. In addition to the dates of games, spaces for entering scores, etc., this little book will give you some information about the splendid passenger service of the Nickel Plate road.

OFFICE OF ENGINEER, NINTH AND Eleventh Districts, Detroit, Mich., May 14, 1894. Proposals will be received at this office until 3 o'clock p. m. of Thursday, the 31st day of May, 1894, for furnishing the materials and labor of all kinds necessary for the completion and delivery of the metal work for tower for Twin River Point light station, Wisconsin. Plans specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. M. E. ADAMS, Major of Engineers, U. S. Army, Light House Engineer.

TREASURY DEPARTMENT, OFFICE OF General Superintendent U. S. Life-Saving Service, Washington, D. C., May 1, 1894. Sealed proposals will be received at this office until 2 o'clock, p. m. of Thursday, the 31st day of May, 1894, for furnishing supplies required for use of the Life-Saving Service for the fiscal year ending June 30, 1895; the supplies to be delivered at such points in New York City, Grand Haven, Mich., and San Francisco, Cal., as may be required, and in the quantities named in the specifications. The supplies needed consists of Beds and Bedding, Blocks and Sheaves, Cordage, Crockery, Furniture, Hardware, Lamps, Lanterns, etc.; Lumber, Medicines, etc.; Paints, Oils, etc.; Ship Chandlery, Stoves, etc.; Tools, and miscellaneous articles; all of which are enumerated in the specifiations attached to the form of bid, etc., which may be obtained upon application to this office, or the Inspector of Life-Saving Stations, 24 State street, New York City; Superintendent Eleventh Life-Saving District, Grand Haven, Mich., and Superintendent Twelfth Life-Saving District, Appraisers' New Building, San Francisco, Cal. Envelopes containing proposals should be addressed to the "General Superintendent U. S. Life-Saving Service, Washington, D. C.," and marked on the outside "Proposals for Annual Supplies." The right is reserved to reject any or all bids and to waive defects, if deemed for the interests of the Government.

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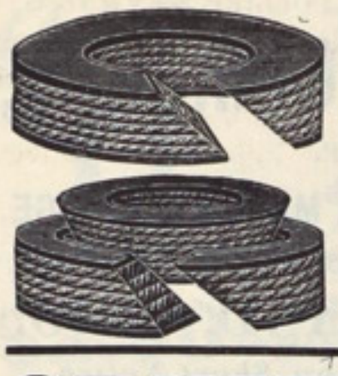

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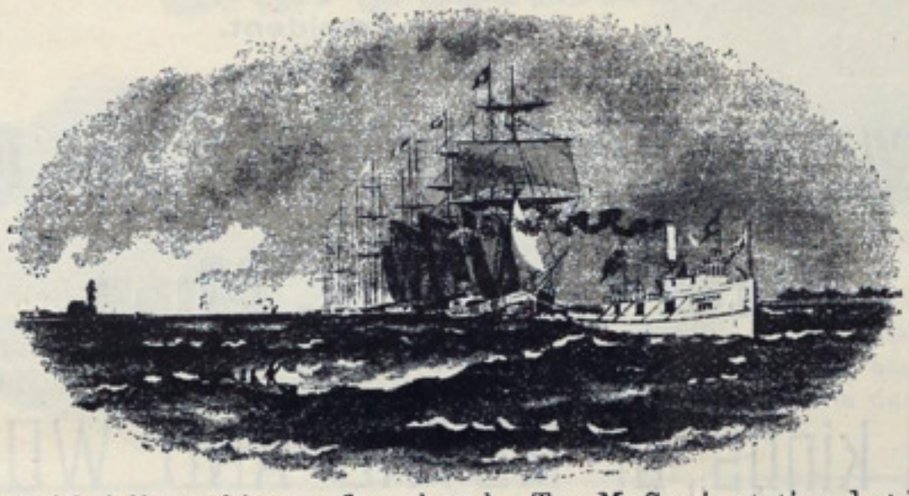

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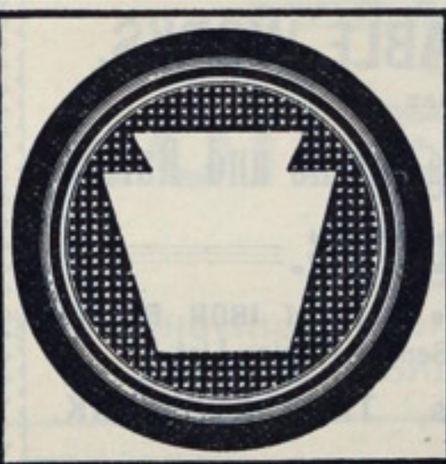

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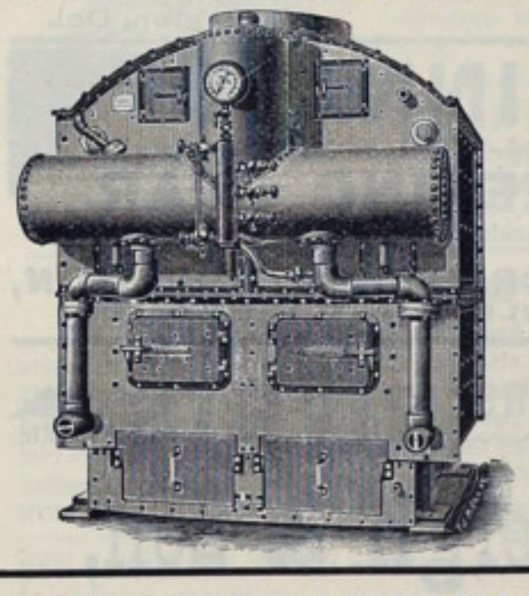

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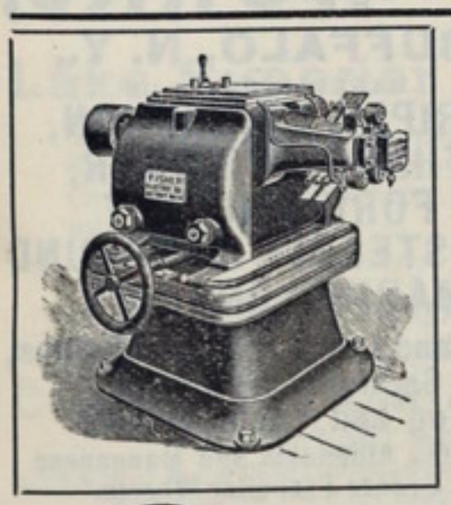

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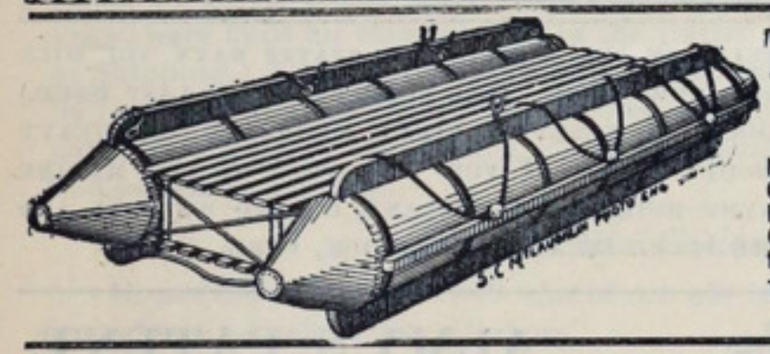

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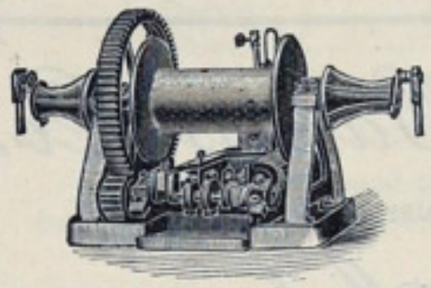

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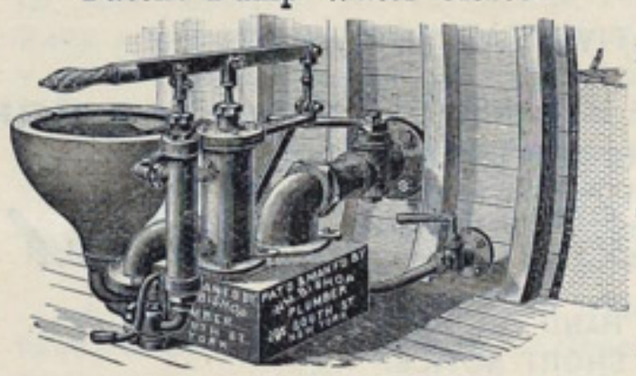

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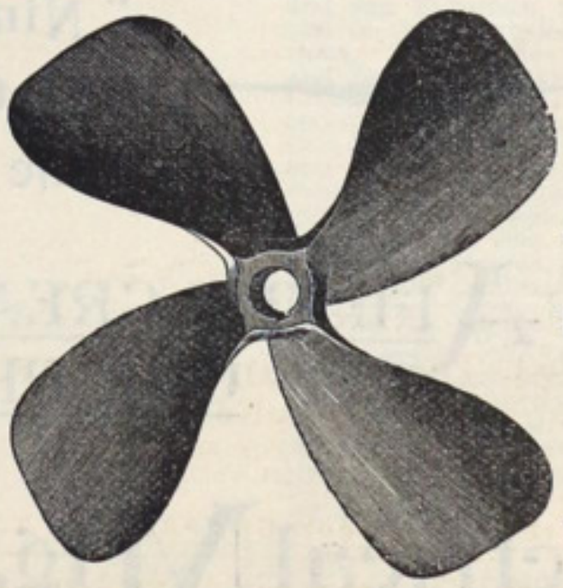

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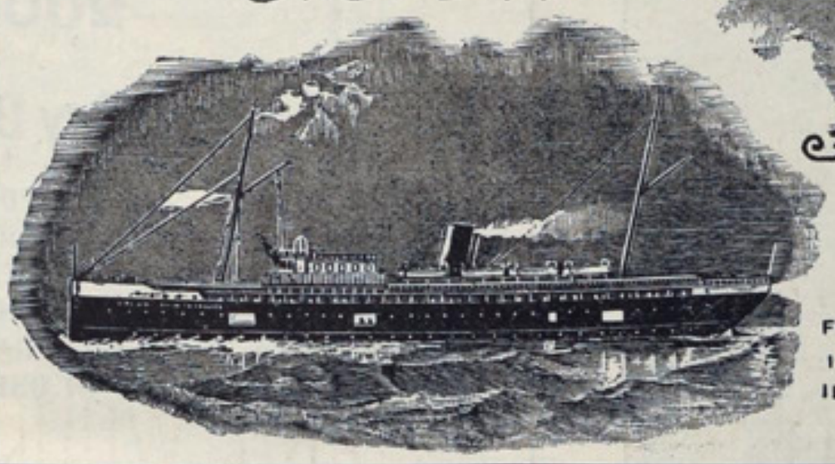

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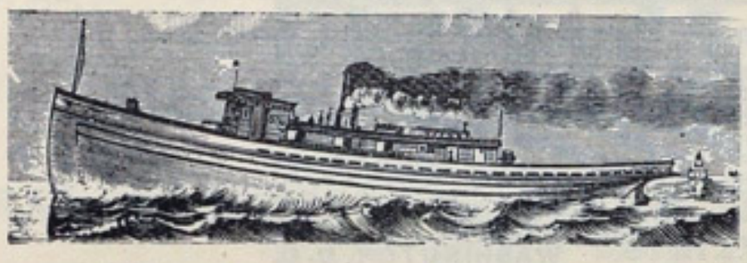

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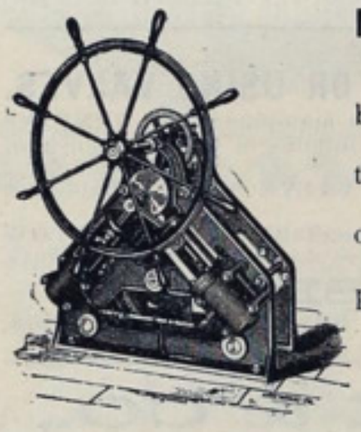

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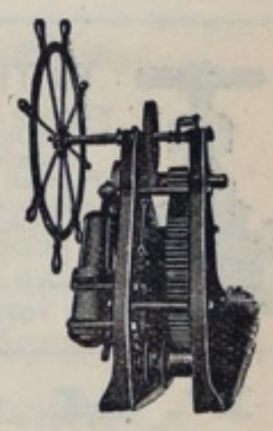

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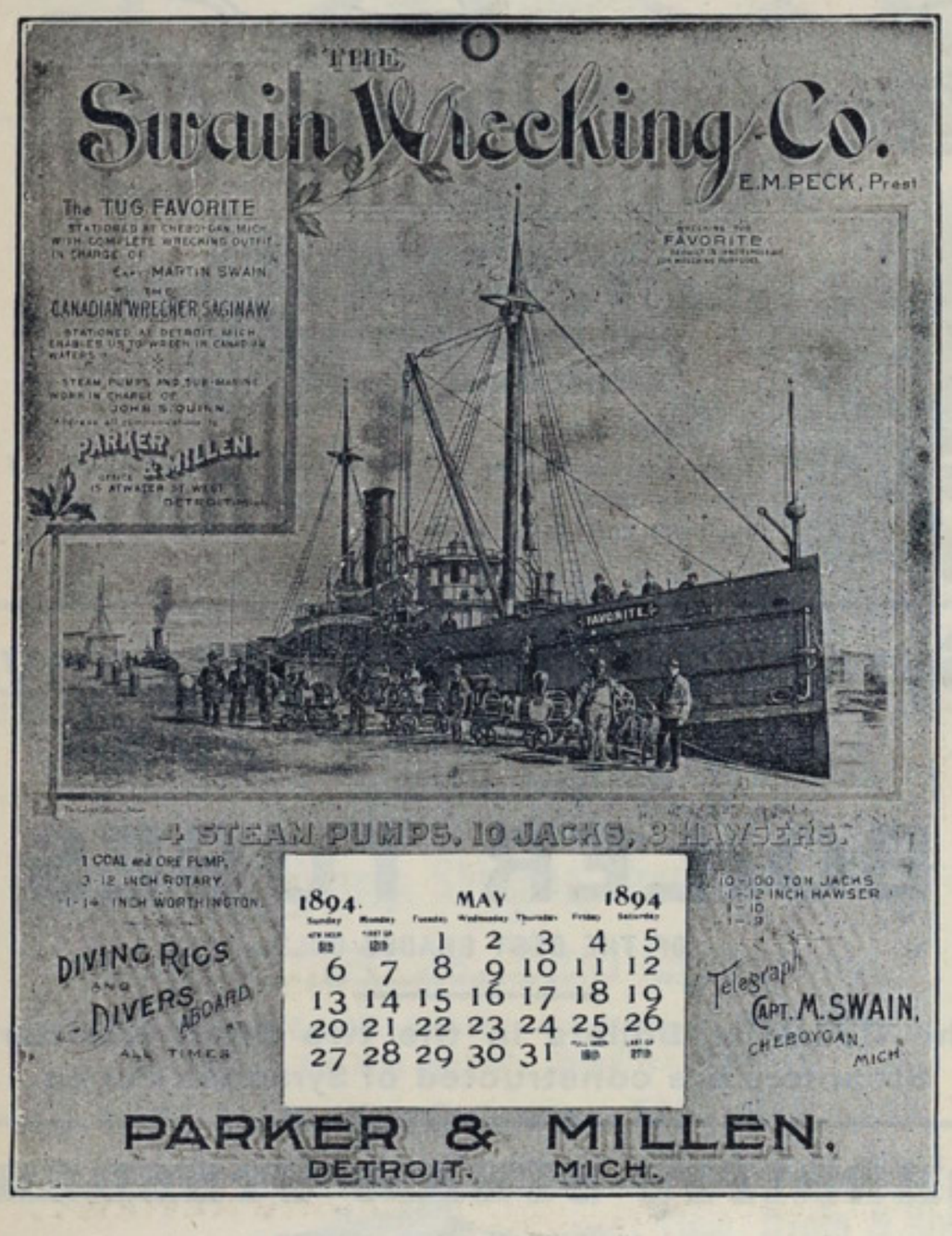

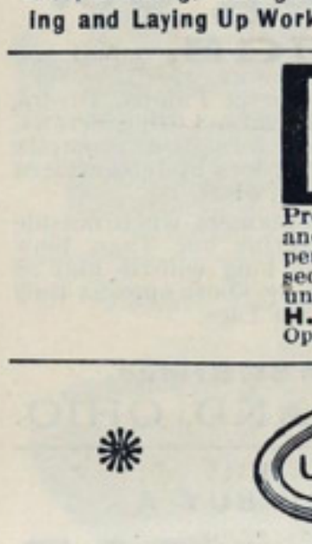

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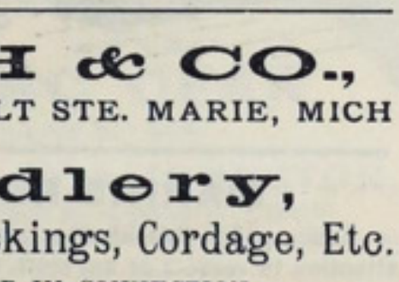

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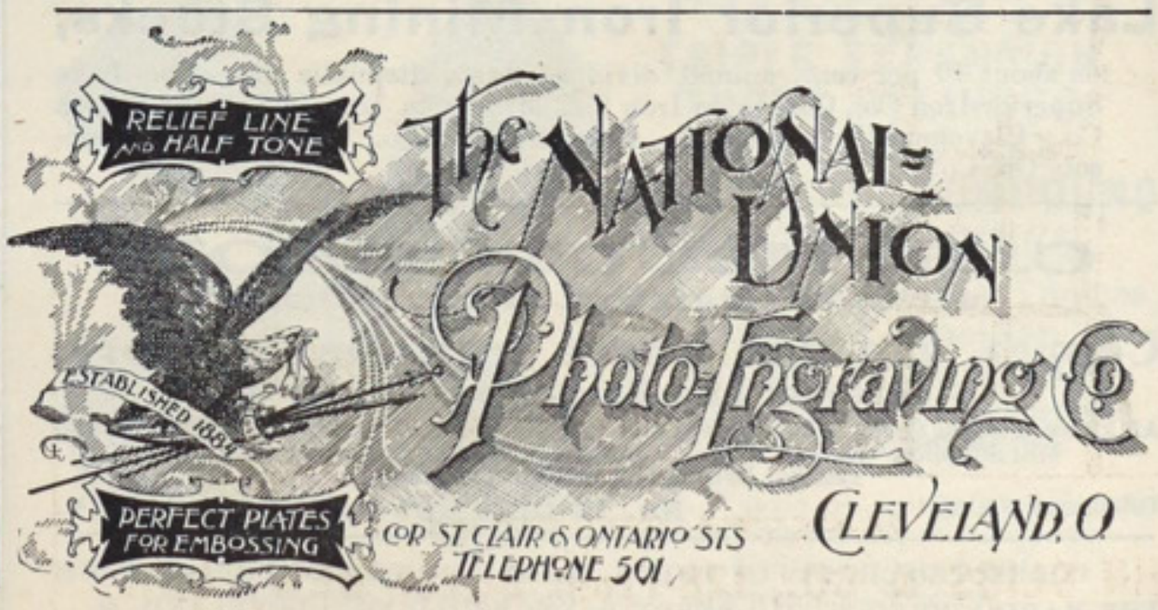

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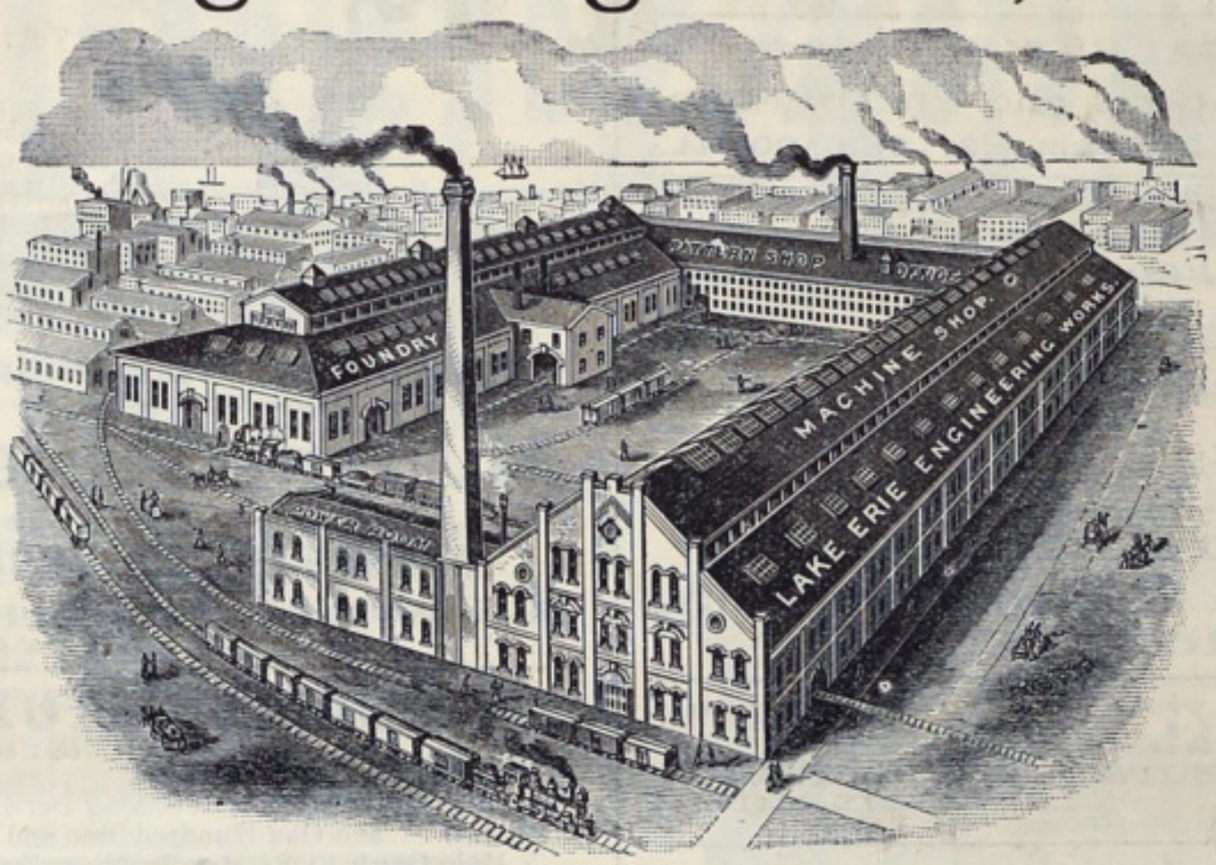

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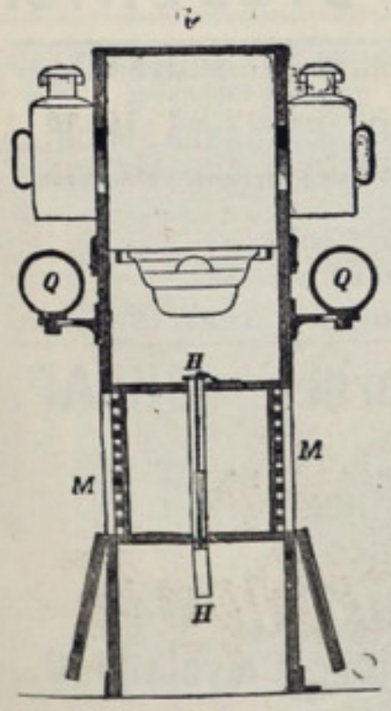

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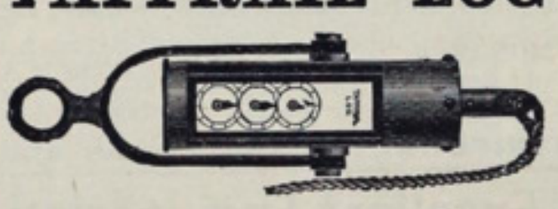

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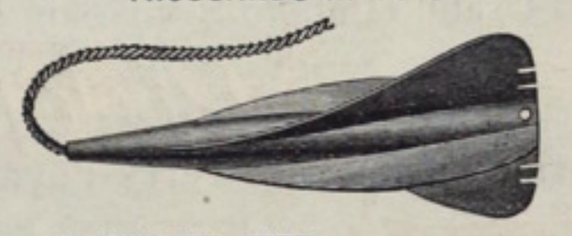

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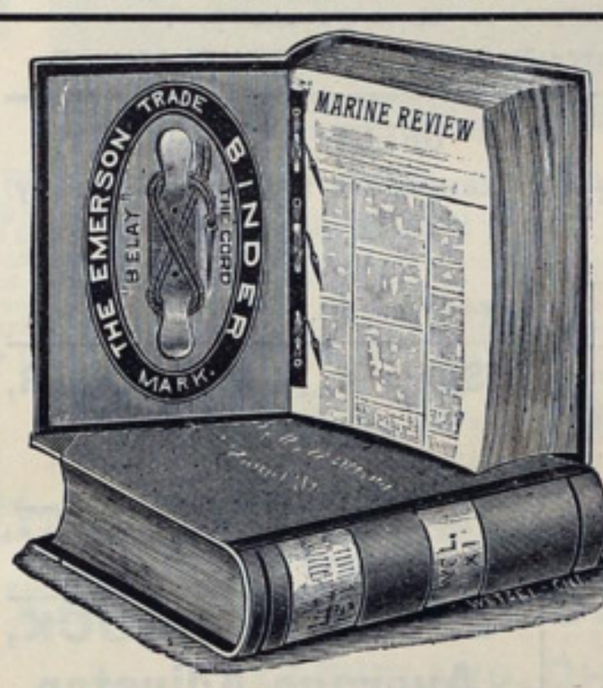

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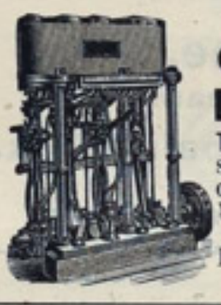

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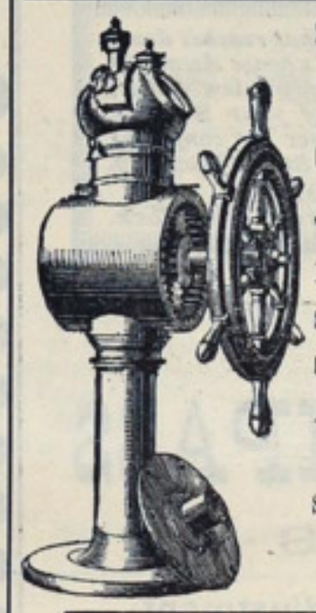

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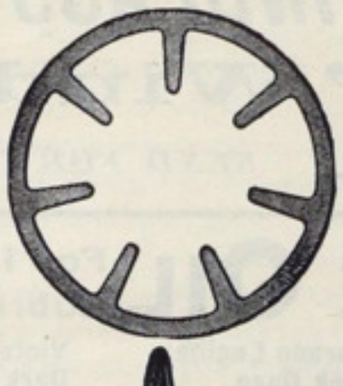

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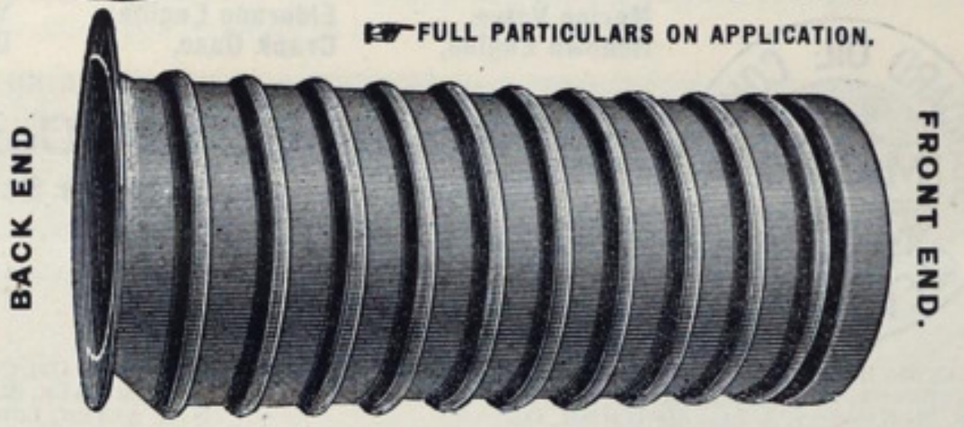

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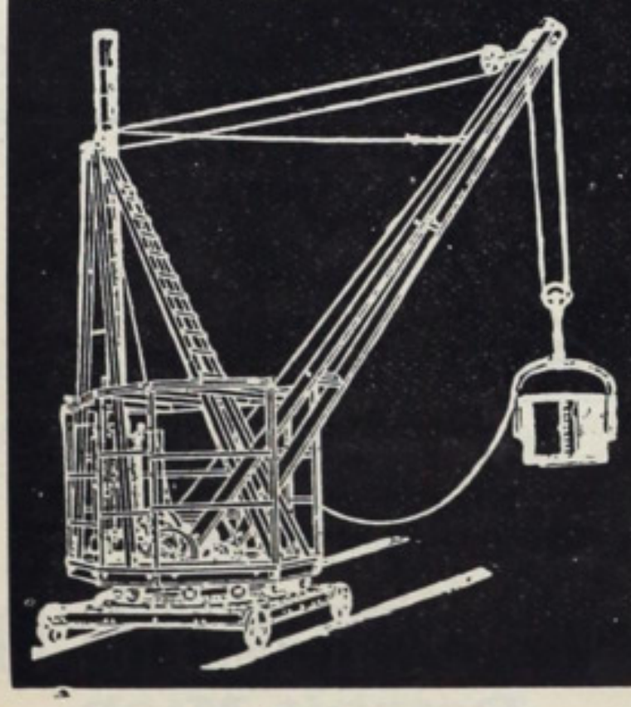

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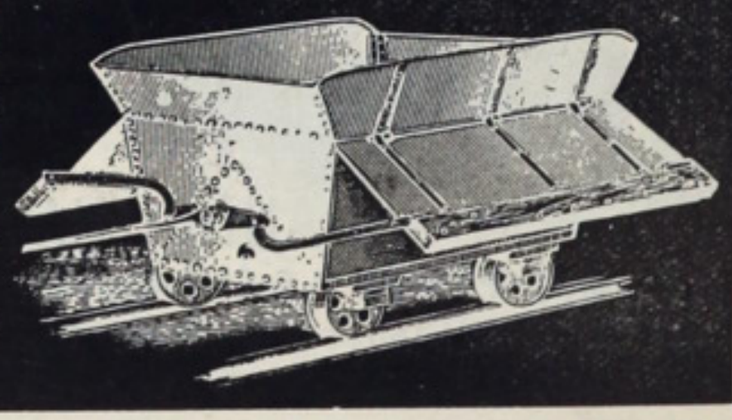

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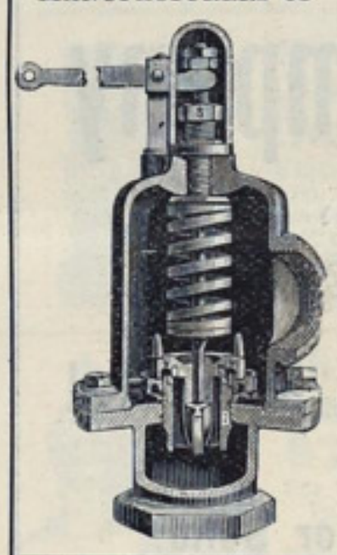

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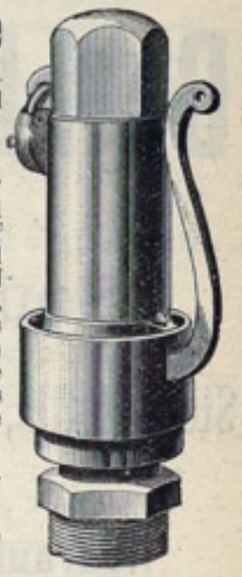

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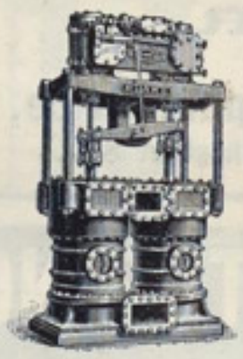

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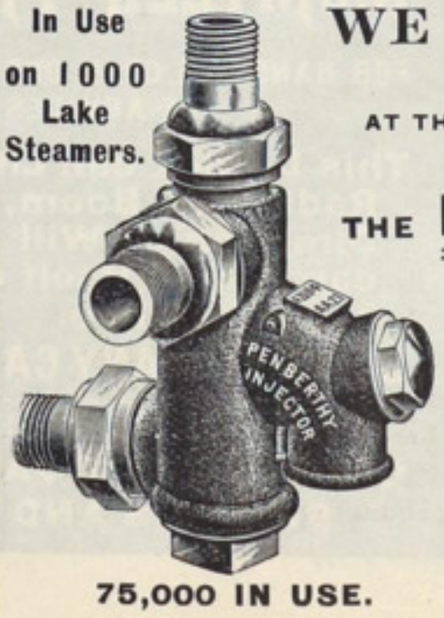

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